

AMENDED CLAIMS

**[received by the International Bureau on 05 July 2004 (05.07.04);
original claims 3, 6, 7 and 16-43 amended; new claims 57-64 added;
remaining claims unchanged (9 pages)]**

1 1. A concrete mixing truck for transporting concrete from one
2 location to another comprising:
3 a chassis including: a frame, a first power source coupled to the
4 frame, wheels coupled to the frame, and a first drivetrain coupling the first
5 power source and the wheels;
6 a second drivetrain coupled to a second power source; and
7 a mixing drum coupled to the frame and to the second drivetrain,
8 the drum comprising:
9 a wall defining a first end of the drum and a second end of
10 the drum;
11 a drive ring coupled to the first end of the drum and
12 comprising:
13 a hub operatively coupled to the second drivetrain;
14 and
15 a plurality of extensions extending outwardly from
16 the hub into the wall of the drum, at least one of the extensions
17 including an aperture extending therethrough;
18 wherein rotation of the hub by the second drivetrain causes
19 rotation of the drum.

1 2. The concrete mixing truck of claim 1, wherein the first power
2 source and the second power source are the same power source.

1 3. The concrete mixing truck of claim 1, wherein the wall includes a
2 first layer and a second layer exterior to the first layer.

1 4. The concrete mixing truck of claim 3, wherein the extensions
2 extend into the second layer of the wall.

1 5. The concrete mixing truck of claim 4, wherein the first layer is
2 made from an elastomeric material.

1 6. The concrete mixing truck of claim 5, wherein the second layer is
2 made from a reinforced composite material including fibers and resin.

1 7. The concrete mixing truck of claim 6, wherein the aperture is
2 configured to allow the resin used in the construction of the second layer of
3 the wall to infiltrate the aperture.

1 8. The concrete mixing truck of claim 7, wherein the fiber in the
2 second layer extends between the extensions.

1 9. The concrete mixing truck of claim 8, wherein the hub is
2 substantially cylindrical.

1 10. The concrete mixing truck of claim 9, wherein the extensions
2 extend radially outward from the hub.

1 11. The concrete mixing truck of claim 10, wherein the extensions are
2 spaced apart around the hub.

1 12. The concrete mixing truck of claim 1, wherein the extensions are
2 triangular.

1 13. The concrete mixing truck of claim 1, wherein the extensions are
2 rectangular.

1 14. The concrete mixing truck of claim 1, wherein the drive ring is
2 integrally formed as a single unitary body.

1 15. The concrete mixing truck of claim 14, wherein drive ring is
2 formed from a cast material.

1 16. A composite, heavy duty rotary concrete mixing drum for coupling
2 to a vehicle having a drivetrain for rotating the drum, the drum comprising:
3 a wall defining a first end of the drum and a second end of the
4 drum;

5 a drive ring coupled to the first end of the drum and comprising:
6 a hub configured to be operatively coupled to the drivetrain;
7 and
8 a plurality of extensions extending outwardly from the hub
9 into the wall of the drum, at least one of the extensions including an
10 aperture;
11 wherein rotation of the hub by the drivetrain causes rotation of
12 the drum.

1 17. The concrete mixing drum of claim 16, wherein the wall includes
2 a first layer and a second layer.

1 18. The concrete mixing drum of claim 17, wherein the extensions
2 extend into the second layer of the wall.

1 19. The concrete mixing drum of claim 18, wherein the first layer is
2 made from an elastomeric material.

1 20. The concrete mixing drum of claim 19, wherein the second layer
2 is made from a fiber reinforced composite material.

1 21. The concrete mixing drum of claim 20, wherein the aperture is
2 configured to allow resin used in the construction of the second layer of the
3 drum to infiltrate the aperture.

1 22. The concrete mixing drum of claim 21, wherein the fiber in the
2 second layer extends between the extensions.

1 23. The concrete mixing drum of claim 22, wherein the hub is
2 substantially cylindrical.

1 24. The concrete mixing drum of claim 23, wherein the extensions
2 extend radially outward from the hub.

1 25. The concrete mixing drum of claim 24, wherein the extensions are
2 spaced apart around the hub.

1 26. The concrete mixing drum of claim 16, wherein the extensions are
2 triangular.

1 27. The concrete mixing drum of claim 16, wherein the extensions are
2 rectangular.

1 28. The concrete mixing drum of claim 16, wherein the drive ring is
2 formed from a cast material.

1 29. The concrete mixing drum of claim 28, wherein the cast material
2 is off-tempered ductile iron.

1 30. A composite, heavy duty rotary concrete mixing drum for coupling
2 to a vehicle having a drivetrain for rotating the drum, the drum comprising:
3 a wall defining a first end of the drum and a second end of the
4 drum;
5 a drive ring integrally formed as a single unitary body from a cast
6 material, wherein the drive ring is coupled to the first end of the drum and
7 comprising:
8 a hub configured to be operatively coupled to the drivetrain;
9 and
10 a plurality of extensions extending outwardly from the hub
11 into the wall of the drum;
12 wherein rotation of the hub by the second drivetrain causes
13 rotation of the drum.

1 31. The concrete mixing drum of claim 30, wherein at least one of the
2 extensions includes a aperture extending therethrough.

1 32. The concrete mixing drum of claim 30, wherein the wall includes
2 a first layer and a second layer.

- 1 33. The concrete mixing drum of claim 32, wherein the extensions
2 extend into the second layer of the wall.
- 1 34. The concrete mixing drum of claim 33, wherein the first layer is
2 made from an elastomeric material.
- 1 35. The concrete mixing drum of claim 34, wherein the second layer
2 is made from a fiber reinforced composite material.
- 1 36. The concrete mixing drum of claim 35, wherein the aperture is
2 configured to allow resin used in the construction of the second layer of the
3 wall to infiltrate the aperture.
- 1 37. The concrete mixing drum of claim 36, wherein the fiber in the
2 second layer extends between the extensions.
- 1 38. The concrete mixing drum of claim 37, wherein the hub is
2 substantially cylindrical.
- 1 39. The concrete mixing drum of claim 38, wherein the extensions
2 extend radially outward from the hub.
- 1 40. The concrete mixing drum of claim 39, wherein the extensions are
2 spaced apart around the hub.
- 1 41. The concrete mixing drum of claim 30, wherein the extensions are
2 triangular.
- 1 42. The concrete mixing drum of claim 30, wherein the extensions are
2 rectangular.
- 1 43. The concrete mixing drum of claim 30, wherein the cast material
2 is off-tempered ductile iron.

1 44. A drive ring for coupling to a heavy duty rotary concrete mixing
2 drum capable of attachment to a vehicle having a drivetrain for rotating the
3 drum, the drive ring comprising:

4 a hub configured to be operatively coupled to the drivetrain of the
5 vehicle; and

6 a plurality of projections extending outwardly from the hub and
7 configured to engage the drum, at least one of the projections including an
8 aperture.

9 45. The drive ring of claim 44, wherein the aperture is configured to
10 allow resin used in the construction of the drum to infiltrate the aperture.

1 46. The drive ring of claim 44, wherein the projections are configured
2 to allow fiber used in the construction of the drum to extend between the
3 projections.

1 47. The drive ring of claim 44, wherein the hub is substantially
2 cylindrical.

1 48. The drive ring of claim 47, wherein the projections extend radially
2 outward from the hub.

1 49. The drive ring of claim 44, wherein the distance between each of
2 the projections around the hub is less than 6 inches.

1 50. The drive ring of claim 44, wherein the plurality of projections
2 includes 12 projections.

1 51. The drive ring of claim 48, wherein the projections are spaced
2 apart around the periphery of the hub.

1 52. The drive ring of claim 44, wherein the projections are triangular.

1 53. The drive ring of claim 44, wherein the projections are
2 rectangular.

1 54. The drive ring of claim 44, wherein the drive ring is integrally
2 formed as a single unitary body from a cast material.

1 55. The drive ring of claim 54, wherein the cast material is off-
2 tempered ductile iron.

1 56. The drive ring of claim 44, wherein the extensions are configured
2 to angle toward the mixing drum.

1 57. A method of coupling a drive ring to a wall of a composite mixing
2 drum, the wall comprising fibers and resin, the drive ring being configured to
3 transfer a rotational force applied by a powered drivetrain to the wall, the
4 method comprising the steps of:

5 providing a drive ring including:

6 a hub configured to be coupled to the powered drivetrain,

7 and

8 a plurality of extensions extending outwardly from the hub;

9 forming the wall around the extensions; and

10 mechanically interlocking the wall to the drive ring;

11 so that when the drive ring is coupled to the powered drivetrain,
12 the force applied by the powered drivetrain to the drive ring will be distributed
13 within the wall.

1 58. The method of claim 57, wherein the step of forming the wall
2 around the extensions comprises the step of wrapping the fibers of the wall
3 around at least one of the extensions.

1 59. The method of claim 57, wherein the extensions include apertures
2 and wherein the step of mechanically interlocking the wall to the drive ring
3 comprises the step of filling the apertures with the resin of the wall.

1 60. The method of claim 57, wherein the extensions each include an
2 aperture and wherein the step of mechanically interlocking the wall to the drive
3 ring comprises the step of filling each aperture with the resin of the wall.

1 61. The method of claim 57, wherein the hub and the extensions of
2 the drive ring are formed as a single unitary body from a cast material.

1 62. The method of claim 57, wherein the extensions each include an
2 aperture and wherein the step of mechanically interlocking the wall to the drive
3 ring comprises the step of forming a portion of the wall within the aperture.

1 63. A concrete mixing drum for coupling to a power source for
2 rotating the drum, the drum comprising:
3 a wall defining a first end of the drum and a second end of the
4 drum;
5 a drive ring coupled to the first end of the drum and comprising:
6 a hub configured to be operatively coupled to the power
7 source; and
8 a plurality of extensions extending outwardly from the hub
9 into the wall of the drum, at least one of the extensions including an
10 aperture;
11 wherein rotation of the hub by the power source causes rotation
12 of the drum.

1 64. A concrete mixing drum for coupling to a power source for
2 rotating the drum, the drum comprising:
3 a wall;
4 a drive ring coupled to the wall and comprising:
5 a hub configured to be operatively coupled to the power
6 source; and
7 a plurality of extensions extending outwardly from the hub
8 into the wall,
9 one of the wall and the plurality of extensions including a plurality
10 of recesses, the other one of the wall and the plurality of extensions including
11 a plurality of corresponding projections for engaging the plurality of recesses;
12 wherein rotation of the hub by the power source causes rotation
13 of the drum.